

REMARKS

Claims 1, 2, and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Reuter (EP ‘ 667). Applicants traverse this rejection because Reuter fails to disclose or suggest a belt reinforcement layer wherein the outer diameter of the belt reinforcement layer at a tread center portion of the tire is set to be 1.065 to 1.13 times an outer diameter of an edge of the belt reinforcement layer. Applicants further traverse the rejection because Reuter does not disclose or suggest that the belt reinforcement layer overhangs the maximum width portion of the belt layer by 15 to 20 mm, or that an intermediate elongation of reinforcing cords of the belt reinforcement layer after vulcanization and under a load of 67N is set in the range of 3.5 to 5.5%.

As recited in claim 1 of the present specification, an outer diameter of a belt reinforcement layer at a tread center portion of the layer is only 1.065 to 1.13 times larger than an outer diameter of a terminal edge of the layer in an overhanging portion. Accordingly, the difference in diameters at different portions of the belt reinforcement layer is relatively small. This small difference in diameters allows a load received by a tire to be spread across a larger portion of the belt reinforcement layer, reducing the load received by the edges of the belt reinforcement layer. Thus, it is possible to increase durability and reduce deterioration of the terminal of the belt reinforcement layer even if an intermediate elongation of the reinforcing cords of the belt reinforcement layer is made comparatively smaller.

In contrast, Reuter teaches that a spirally wound overlay structure overlaps the lateral ends of the radially outermost belt ply by a few millimeters. The examiner asserts that the overlap described by Reuter specifies an absolute dimension that is not a function of the specific tire size, and that therefore the diameter relationship would be greater in smaller tires. Thus, the examiner seems to assert that radius of curvature of the tire tread would be independent of the tire size. However, applicants assert that in practice the radius of curvature of a tire varies depending on the tire diameter. That is, when providing a tire of a different size, not only does the diameter vary, but the radius of curvature also varies in accordance with the diameter. Additionally, Reuter discloses that the spirally wound overlay structure overlaps the lateral ends of the radially outermost belt ply. Applicants assert that the term “overlaps” is generally understood to mean to coincide partially or wholly, and is distinct from terms such as overhang or protrude. However, the examiner appears to be interpreting the term overlaps as used in Reuter in a manner that is synonymous with overhanging or protruding. Applicants respectfully submit that this interpretation is not correct.

Additionally, Reuter discloses that the overlay structure overlaps the lateral ends of the radially outermost belt ply by “a few mm.” The examiner previously interpreted the teaching of Reuter as disclosing an overlay structure that extended at least 5 mm beyond the lateral ends of the radially outermost belt ply. However, applicants assert that the phrase “a few millimeters” fails to disclose or suggest an overhang in the range of 15 to 20 mm, as currently recited in claim 1.

Moreover, Reuter discloses that at a stress of above 60N, or more preferably at a value of about 75N, the elongation of an aramid cord and the spirally wound overlay should be 3%. Additionally, applicants note that Reuter fails to disclose or suggest an elongation of larger than 3% for any amount of stress applied to the aramid cords and the spirally wound overlay. Accordingly, Reuter fails to disclose or suggest an elongation that is set to be between 3.5% and 5.5% under a load of 67N, as recited in amended claim 1. For all the above reasons, applicants respectfully request withdrawal of this rejection.

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Reuter, and further in view of Poque (DE ‘817). Claim 3 depends from independent claim 1, and as such necessarily incorporates all the features of claim 1, plus additional features. Accordingly, applicant respectfully requests that the rejection of dependent claim 3 be withdrawn in light of the above remarks directed to claim 1, and because Poque does not remedy the deficiencies identified with respect to the rejection of claim 1.

Claims 1, 2, and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hirai (JP ‘015) and further in view Reuter. Applicants traverse this rejection because the Hirai and Reuter, taken alone or in combination, fail to disclose or suggest a belt reinforcement layer that overhangs the widest portion of an underlying belt layer by an amount in the range 15 to 20 mm. The cited prior art references also fail to disclose an elongation of reinforcing cords in the belt reinforcement layer after vulcanization and underload of 67N that is in the range of 3.5 to 5.5%.

The examiner asserts that the figures of Hirai showing a pneumatic tire having a plurality of belt layers 6 and a radially outermost belt reinforcement layer 7, where the belt reinforcement layer overhangs the end of the underlying belt layers by a distance of at least 10 mm. However, Hirai does not appear to disclose a belt reinforcement layer where the reinforcement layer overhangs the widest portion of the underlying belt layers by a distance in the range of 15 to 20 mm. Moreover, as discussed above, Reuter discloses only that an overlay structure overlaps the lateral ends of the radially outermost belt ply by a few millimeters. Accordingly, Reuter and Hirai, taken alone or in combination, do not disclose or suggest a belt reinforcement layer that overhangs the widest portion of the underlying belt layers by 15 to 20 mm.

Additionally, Hirai is silent regarding the properties of the cords used in formation of the reinforcing layer. As discussed above, Reuter discloses an elongation of 3% under a load of more than 60N and more preferably about 75N. Accordingly, the cited prior art references, taken alone or in combination, do not disclose or suggest than an intermediate elongation of reinforcing cords of a belt reinforcement layer after vulcanization and underload of 67N is set in a range of 3.5 to 5.5%. For at least these reasons, applicants respectfully request withdrawal of the rejection based on Hirai and Reuter.

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hirai and Reuter, and further in view of Poque. Applicants respectfully traverse this rejection for the reasons given above with respect to claim 1, from which claim 3 depends,

and because of the additional features recited in claim 3. Withdrawal of the rejection is respectfully requested.

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hirai and Riva, and further in view of Nishizawa ‘262. Applicants traverse this rejection because the cited prior art references, whether taken alone or in combination, do not disclose or suggest that the cord-to-cord distances between the belt reinforcement layer and the belt layer, and between the belt reinforcement layer and the carcass layer are set between 0.5 mm and 1.5 mm.

Nishizawa discloses that the shortest vertical distance between adjacent metal filaments in adjoining metal cord layers is in a range of 0.5 mm and 1.3 mm. However, Nishizawa fails to disclose a cord-to-cord distance between a belt layer and a carcass layer, or a cord-to-cord distance between a belt reinforcement layer and a belt layer.

The examiner asserts that one of ordinary skill in the art would have recognized that the values of Nishizawa are consistent with the separation of reinforcement elements and adjacent tire layers. However, applicants respectfully disagree. Since the belt layer, the belt reinforcement layer and the carcass layer are each made using different types of reinforcement cords, the thickness of topping rubbers used in the layers varies as well. Accordingly, because the thickness of the topping rubbers is different in each of the belt layer, belt reinforcement layer, and the carcass layer, the cord-to-cord distance between the layers varies depending on the type of layers being measured. That is, the distance between a belt layer and a carcass layer is not necessarily as the same as the distance between a belt

layer and a belt reinforcement layer. For this additional reason, applicants respectfully request withdrawal of the rejection of claim 4.

For the foregoing reasons, applicants believe that this case is in condition for allowance, which is respectfully requested. The examiner should call applicants' attorney if an interview would expedite prosecution.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By 
Kevin T. Bastuba
Registration No. 59,905

June 30, 2008

300 South Wacker Drive
Suite 2500
Chicago, Illinois 60606
Telephone: 312.360.0080
Facsimile: 312.360.9315

Customer No. 24978